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New lichen records from Turkey

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Abstract — Four species of lichen forming fungi — *Lecanora praesistens*, *Staurothele levinae, Tephromela cypria,* and *Xanthoparmelia ryssolea* — are reported as new to the lichen biota of Turkey. For each a short description is presented.

Key words — Adıyaman, Afyon, *Ascomycetes*, Erzurum, Konya

Introduction

Interest in the lichen biota of Turkey has greatly increased in recent years, while 78 and 73 new lichen-forming and lichenocolous fungi taxa were recorded as new to Turkish lichen biota alone in 2007 and 2008, respectively, whereas 18 of them are newly described species (Candan & Halıcı 2008, Candan & Özdemir-Türk 2008, Çobanoğlu 2007, Halıcı 2008a,b,c,d, Halıcı & Candan 2007, Halıcı & Cansaran-Duman 2007, Halıcı & Güvenç 2008, Halıcı & Hawksworth 2007, 2008; Halıcı et al. 2007a,b,c,d,e,f,g, 2008; Hawksworth & Halıcı 2007, Hertel & Leuckert 2008, Kınalıoğlu 2007a,b, Oran & Öztürk 2007, Özdemir-Türk et al. 2007, Pišút & Guttová 2008, Printzen 2007, Vondrák & Kocourková 2008, Vondrák et al. 2008a,b, Yazıcı & Aptroot 2008, Yazıcı & Aslan 2007, Yazıcı et al. 2007, 2008).

In this present study, some historical collections collected in the last century, which are deposited in herbaria of Natural History Museum Vienna (W) and University of Vienna Herbarium (WU), are re-examined and of these, *Lecanora praesistens* and *Staurothele levinae* are reported as new to Turkish lichen biota, whereas other new records are *Tephromela cypria* and *Xanthoparmelia ryssolea*, which were collected recently from Afyon province by the author, are deposited at the Aegean University Botanical Garden & Herbarium Research and Application Centre (EGE).

Materials and methods

Two of the materials, deposited in W and WU, were studied in Vienna, while the other two were collected from Afyon province in May 2008. For this study, a stereo microscope, a compound microscope and the standard spot tests were used in the identification of the samples, together with the following references: Clauzade & Roux (1985), Guderley & Lumbsch (1999), Esslinger (1977), Kopaczevskaja et al. (1971), Oxner (1939), Poelt & Vězda (1981), Purvis et al. (1992) and Wirth (1995). Descriptions of the species based both on these literatures and on own observations.

High performance thin-layer chromatography (HPTLC) follows the methods of Arup et al. (1993), however *Buellia subdisciformis* (Leight.) Vain. was used as reference for atranorin and norstictic acid; specimens of *Tephromela atra* (Huds.) Hafellner and *Xanthoparmelia pokornyi* (Körb.) O. Blanco et al. in the private herbarium of the present author were used for comparing the HPTLC results with other lichen substances such α-collatolic, gyrophoric and stenosporic acids.

Results and discussion

Lecanora praesistens Nyl.

Thallus corticolous, crustose, uniform, adnate, dispersed verrucose to verruculose or continuous, yellowish white to cream coloured or greenish grey, epruinose; soredia, isidia and pseudocyphellae absent; photobiont *Trebouxia;* prothallus not visible. Ascomata apothecia, sessile to subimmersed, 0.5–1.6 mm in diam., disc red-brown to blackish brown, intensely dark brown when wet, sometimes reddish orange, epruinose to slightly greyish pruinose; apothecial margins concolorous with thallus, sometimes slightly darker, thin, smooth, entire, verrucose to slightly crenulated; cortex indistinct, hyaline to yellowish, interspersed with small crystals, 20–40 µm laterally, 30–60 µm basally; epihymenium reddish brown to yellowish brown, with crystals, pigmentation and crystals dissolving in KOH, ca 10–15 µm high; hymenium 75 µm tall; amphithecium containing large crystals, not altered by KOH; parathecium hyaline, with small crystals, 10–15 µm thick;. hamathecium of paraphyses, about 2 µm thick, simple, sparsely branched, septate, apices slightly capitate. Asci clavate, *Lecanora*-type, (8–)12–16-spored. Ascospores ellipsoid to broadly ellipsoid, rounded at the apices, colourless, simple and smooth-walled, 10–15 × 5–9 µm. Thallus Pd–, K+ yellow, KC–, C– (HPTLC: Atranorin and chloroatranorin).

Distribution—This species is known from different parts of the Alps and the Ukraine (Guderley & Lumbsch 1999).

Specimen examined—[ADIYAMAN:] Kurdistania occidentalis: Taurus Cataonicus. Inter urbem Malatja et vicum Kjachta, ad truncos vivos *Quercus libani* inter Sindschi et Karatschor, ca 1550 m., 15.7.1910, Heinr. Frh. von Handel-Mazzetti, No 2207, Tageb.-No 462 (W1929–15218 and WU040987).

Remarks — (1) *Lecanora praesistens* was reported in Steiner (1921) from the locality "Lebende Quercus Libani-Stämme zw. Sindschi u. Karatschor bei Kjachta im kataonischen Taurus, 1550 m" as "*Lecanora subfusca* (L.) Nyl." This locality correlates to a position between Incile (Sindschi) and Karadut (Karatschor) villages, about 38°02' N, 38°37' E.

(2) In this study, these specimens were revised to *L. praesistens,* which differs from *L. allophana* (Ach.) Ach. by its multispored asci. The difference from other multispored corticolous *Lecanora* species are their amphithecium with large crystals, epihymenium with pigmentations and crystals dissolving in KOH, and red-brown to blackish brown apothecial disc (Guderley & Lumbsch 1999).

Staurothele levinae Oxner

Thallus crustose, superficial, orbicular, 1 cm in diam., indistinctly brown or black-brown, moderately thick, in central parts areolate, and narrowly lobate at the periphery; soredia, isidia and pseudocyphellae absent; photobiont *Stichococcus,* also present in hymenium as numerous globose-cuboid or cylindrical hymenial cells between the asci. Ascomata perithecia, ca 0.3 mm in diam., immersed, single in subglobose areoles; ostiole minute, amphithecia thick; true exciple colourless to pale brown; hamathecium of periphyses; paraphyses absent. Asci verrucarioid, without a distinct ocular chamber, 85–95 × 28–31 µm, 2-spored. Ascospores muriform, ± ellipsoid and rounded at apices, 28–52 × 15–26 µm, colourless to dark brown. Hymenial algal cells numerous, simple, pale yellow-green, cylindrical, 6–10 × 3–4 µm. Thallus Pd–, K–, KC–, C– (HPTLC: No lichen products).

Distribution—This species is known from Afghanistan, Kazakhstan, Mongolia and Tajikistan (Biazrov et al. 1983, Kopaczevskaja et al. 1971, Kudratov & Mayrhofer 2002, Steiner & Poelt 1987).

Specimens examined— [ERZURUM:] Türkei: Ak Dagh inter oppidum Erzerum et Trapezunt, 25.9.1914, V. Pietschmann (W1959–06485). [KONYA:] Sarai dagh bei Konia, 1200 m, 1902, E. Zederbauer (W1905–01999).

Remarks — (1) This species differs from the other *Staurothele* species by its orbicular thallus shape, lobate thallus margin, and dark thallus colour (Oxner 1939).

(2) Both specimens are deposited in W. The specimen from Erzurum was reported in Szatala (1960) as "*S. clopima* (Wahlenb.) Th. Fr.", and the specimen from Konya in Steiner (1905) as "*S. clopima* var. *protuberans* (Schaer.) J. Steiner". The recent locality in Erzurum corresponds to Ak Dağ at the approximate coordinates of 40°15' N, 40°57' E, and those of Konya to Saray Dağ (= Loras Dağı) at approximately 37°46' N, 32°21' E.

(3) These specimens were revised by Maximillian Steiner. Although *S. levinae* is not included in any identification keys, Steiner was familiar with it and distributed it in Lichenotheca Afghanica as No 7 (Steiner & Poelt, 1987).

Tephromela cypria (Körb.) Hafellner

Thallus crustose, rather thick, wartlike areolate, chalky white to ochre, wide spreading to several cm in diam.; areoles to 2 mm in diam., mostly ± contiguous and fused, irregular, often wartlike wrinkled; medulla I–; soredia, isidia and pseudocyphellae absent; photobiont chlorococcoid. Ascomata apothecia, up to 3.5 mm in diam., round or irregular, sessile, black; disc flat or concave; thalline exciple conspicuous, persistent, swollen, ± entire to flexuous at maturity; true exciple thin, ± inconspicuous, without crystals, but containing dense algal communities; epithecium or hymenium with purplish or greenish, N+ red pigments, epithecium dark red-brown; hymenium 50–60 µm tall, dark purplish brown or purple-violet, pale purple-violet in upper part; hypothecium ± ochre below; hamathecium of paraphyses, branching and anastomosing, each with a gelatinous coat; apices with no or just weakly swollen ends, but often with a pigmented hood, 4–5 µm thick. Asci clavate, *Bacidia*-type, 8-spored. Ascospores simple, colourless, ellipsoid, without a distinct perispore, ± thick-walled, 10–15 × 5–8 µm. Conidiomata pycnidia, immersed; wall colourless except for green pigmentations around the ostiole; conidiogenous cells in chains, pleurogenous; conidia cylindrical or short threadlike, straight, simple, colourless, 9–24 × 1–1.5 µm. Cortex Pd–, K+ yellow, KC+ yellow, C– (HPTLC: Atranorin and α-collatolic acid).

Ecology and distribution—This calcareous rock species was reported from Cyprus, France, Greece, Italy, Portugal, Slovakia, Spain and Sweden (Ajaj et al. 2007, Clauzade & Roux 1985, Kalb & Hafellner 1992, Nimis 1993, Litterski & Mayrhofer 1998, Poelt 1974, Sipman & Raus 1999).

Specimen examined—AFYON: Emir Mountains, between the villages Çukurcak and Karapınar, 6th km, N 38°45.07', E 31°24.08', alt. 1310 m a.s.l., 13.10.2008, Ayhan Şenkardeşler (EGE 40724).

Remarks — This species is similar to *Tephromela atra* but differs by its calcicolous habitat, zonate thallus margin, and exciple without crystals but with dense algal communities (Oxner 1939, Kopaczevskaja et al. 1971). The calcicolous records of *T. atra* from SW Asia need revision, since some specimens belonging to *T. cypria* may have been placed here.

Xanthoparmelia ryssolea (Ach.) O. Blanco et al.

Thallus foliose to subfruticose (indistinctly or not dorsiventral) appressed to subpulvinate, loosely or not at all adnate, 1.5–4.5 cm in diam; lobes 1–3 mm broad, 160–600 µm thick, convex to irregularly subterete, sometimes folded

or channelled in places, elongate to linear-elongate, rounded or often once or more furcate at the tip, discrete to loosely imbricate or entangled; upper surface yellowish brown to reddish brown, smooth to somewhat pitted or wrinkled at the periphery, inward more or less smooth to grossly rugose, occasionally developing small lobules, dull throughout to somewhat shiny, rarely lightly pruinose; lower surface more or less concolorous with the upper surface or occasionally paler in places, smooth to rugose, occasionally somewhat channelled, dull to shiny, sparsely rhizinate, the rhizines usually only in a few scattered patches which may be present on the upper surface as well, pale or darkening, to 0.6 mm long; soredia, isidia and pseudocyphellae absent; photobiont trebouxioid. Apothecia and pycnidia not seen. Cortex K–, N+ dark blue-green (usually on both sides); medulla PD–, K–, C– or C+ rose-red, CK–, KC+ red (HPTLC: Gyrophoric and stenosporic acids).

Ecology and distribution—A vagrant species on soil known from Bulgaria, Hungary, Kazakhstan, Mongolia, Rumania, Russia, Spain, and Ukraine (Biazrov 2007, Esslinger 1977, Hawksworth et al. 2008).

Specimen examined—AFYON: Emir Mountains, between the villages Karapınar and Leylekli, 3rd km, N 38°49.75', E 31°25.60', alt. 1290 m a.s.l., 13.10.2008, Ayhan Şenkardeşler (EGE 40725).

Remarks — (1) *Xanthoparmelia ryssolea* differs from most other *Xanthoparmelia* species in its vaganoid growth form. Of the vaganoid growth forms, *X. ryssolea* is most likely to be confused with *X. vagans* (Nyl.) Hale and with extreme forms of *X. pokornyi*. The latter two species, however, are distinctly dorsiventral with a moderately rhizinate lower surface that usually darkens centrally. In *X. ryssolea* both cortices give a N+ spot test, while the lower surface of *X. pokornyi* is largely or wholly N–. In addition, *X. ryssolea* characteristically lacks dorsiventrality (often to an extreme extent) and exhibits a very similar pigment production on both sides of the thallus. The few rhizines are usually found on both surfaces and on some large thalli they alternate between the two surfaces (Esslinger 1977).

(2) This species appears together with *Aspicilia desertorum* (Kremp.) Mereschk. var. *desertorum* and var. *semivagans* Mereschk. in this high plateau. Since all three taxa were collected in heaps, they will be distributed later to several institutions as an exsiccate.

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